Programming III

Laboratory 7-8
Objectives

- Files
- Serialization

Exercises

1. Create a class Christmas Tree class that has like attributes a price, a type (artificial or natural) and a height. Add a transient field that contains the price reduced with 10%.
   a) Create 10 objects, display them.
   b) Create a method that serialize the objects into a file, write and reads each object not the list object
   c) Create a method that reads the objects from the file and display them

2. Create a text file that contains one integer value on each line.
   a) Use `LineNumberReader` class to read the file and display the even numbers from the files that are stored on odd lines
   b) Use `Scanner` class to read the file and calculate the arithmetic and geometric mean of the numbers stored in the file.

3. Read a text file that contains the following information on each line: email address; name; a list of skills (e.g. Popescu.ion@e-uvt.ro; Popescu Ion Vasile; Java beginner; Python advanced; ….
   a) Propose a data structure to load the file content
   b) Read the file and populate the structure
   c) Validate the read data (e.g. email format using Java class Pattern - https://docs.oracle.com/javase/7/docs/api/java/util/regex/Pattern.html)
   d) Display the unique skills from the file and the email address of the people that have this skill

4. Use `File` class to display the content of a directory. Read the directory path from standard input. For each file in the directory display the name, relative path and the file size. For each subdirectory display the number of files contained and its content.

5. Use NIO API in order to:
   a) Copy one file from one directory to another
   b) To filter all files with an extension read from standard input
   c) Delete the content of a directory recursively
   d) Use `WatchService` API to react to file writing in a directory
      1. If a new file is added and has the '.txt' extension then display the information about file name, size and permissions
      2. Otherwise automatically delete the file from the directory
   e) Use NIO to display a zip file content

6. Create a CSV (Comma Separated Values) file that stores objects of type Chair that has like attributes producer, fabric and price. Provide a method that reads the file content and creates a list of chairs, sorts the list deceasing based on chairs price and write the list of chairs in a JSON file format. For each distinct processor create a text file that contains the list of chairs it produces.

7. Using RandomAcessFile class, write a function

   I.

      1. that creates a file with integer numbers.
      2. that displays the content of the file
      3. that replace the negative numbers from the file with their absolute value

   II

      4. Create a class Concert that has a name, a starting time and a distribution list, that contains the names of the singers.
      5. Add to the class methods for writing/reading a concert object using random access file.

8. Define a class date that contains like attributes year, month, day and use StringTokenazer class to parse the following date formats "DD/LL/YYYY" (11/11/2018) and "DD Month YYYY" (11 December 2020) and other types of constructors. Add methods that allow to display the date in different formats. Use java Format class to do the same thing.

Supplementary problem

Read a JSON file that contains information regarding a TV channels timetable. Each TV station has a name, a description and the in a json file is listed the timetable for a week. Each show is characterized by start-stop hour, type (movie, …) a name and a

short description. A directory TV_Scheduler contains a JSON file that contains all TV stations and subdirectories week1, week2, … that contain the detailed program on each week for all TV station.

A. Create the input data structure and propose abstract data structures to store the information. Create a class diagram for it.
B. Load the information related to TV schedules from the JSON files using a JSON library (ex. Google GSON, https://www.oracle.com/technical-resources/articles/java/json.html, https://docs.oracle.com/middleware/1213/wls/WLPRG/java-api-for-json-proc.htm#WLPRG1055)
C. Create and display a report for each TV stations with missing schedulers
D. Create and display a report for each TV based on the shows type
E. Search for a movie name in all TV schedulers
F. Document your project